IN THE DRAWINGS:

The attached drawing sheet is a Replacement Sheet for FIGURE 1. The changes to FIGURE 1 include removing the arrow from block 16 to block 18 and correcting the reference number of block 19. Inadvertently, the Replacement Sheet for FIGURE 1 was not sent with the last response.

Attachment: Replacement Sheet 1/3

REMARKS/ARGUMENTS

The Applicant originally submitted Claims 1-23 in the application. In the previous response the Applicant amended Claims 1, 10, 14, 17 and 23. In the present response, the Applicant has amended Claims 1-4, 6-9, 11-12, 15-16 and 18-23. No claims have been canceled or added. Accordingly, Claims 1-23 are currently pending in the application.

I. Formal Matters and Objections

In the previous Examiner's Action, the Examiner has objected to the drawings due to the confusion caused by the arrows leaving block #16 and the reference number for "Process Translation" block. In response, the Applicant amended FIGURE 1 to indicate an arrow from block #16 only goes to block #17 and that the correct reference number for the "Process Translation" block is 19. Inadvertently, the Replacement Sheet was not provided to the Examiner. Accordingly, the Applicant submits the Replacement Sheet with the present response and respectfully requests the Examiner to withdraw this objection of the drawings.

II. Requirement for Information

The Examiner has requested "Software Model Checking: Extracting Verification Models from Source Code." In response, the Applicant has provided a copy of the requested document.

III. Rejection of Claims 1-23 under 35 U.S.C. §103

The Examiner has rejected Claims 1-23 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,671,416 to Elson in view of U.S. Patent No. 6,330,530 to Horiguchi. The Applicants respectfully disagree.

Horiguchi is directed to a language translation system and, more specifically, transformation of a source language linguistic structure (such as English) into a target language linguistic structure (such as Japanese). (*See* column 1, lines 9-12 and column 2, lines 8-11.) Elson relates to methods for analyzing and modifying large computer programs. Elson discloses a source program compiler and compiler preprocessor, which provide a parse tree representation of the source program that can be processed by a new parse tree query language processor. The new parse tree query language processor provides a new tool for querying and rewriting the source program, inserting changes and modifications into an original source code of a program or replacing the original source code with the rewritten source code, and for identifying sections of code for breakpoints during debugging. (*See* column 1, lines 14-26.)

Neither Elson nor Horiguchi, however, teach or suggest automatically extracting a verification model or finite state model from source code as recited in independent Claims 1, 19, 20 and 23, respectively. Horiguchi is directed to translating one language into another language while Elson is directed to correction or modification of high level programming languages such as "C." (*See* column 2, lines 38-47 of Horiguchi and column 2, lines 28-31 of Elson.) The Applicant does not find a teaching or suggestion in either Horiguchi or Elson of a verification model or finite state model that is automatically extracted from source code.

Additionally, neither Elson nor Horiguchi teach or suggest translating text strings (or expressing a finite state model) in an input language for a logic model checker as recited in independent Claims 1, 19, 20 and 23, respectively. Instead, Elson discloses a process that simplifies modifying a high level language. (*See* column 1, lines 62-64 and column 2, lines 28-44.) Thus, Elson addresses updating source code but not translating text strings of source code to an input language for a logic model checker. Horiguchi, on the other hand, discloses translating an input source linguistic structure to a target linguistic language structure. (*See* column 2, lines 38-41.) Horiguchi provides no teaching or suggestion that the target linguistic language structure is an input language for a logic model checker but teaches that the target linguistic language structure is another language (*i.e.*, from English to Japanese). (*See* column 1, lines 9-12 and column 2, lines 8-11.)

Specifically addressing independent Claims 1 and 23, as recognized by the Examiner, Horiguchi does not teach or suggest generating a parse tree to define a control flow from source code for procedural elements as recited in independent Claims 1 and 23. (*See* Examiner's Action, pages 3-4.) Elson does not cure this deficiency. Instead, Elson generates a "complete parse tree from source code modules" to represent a new expanded version of the source code. (*See* column 1, lines 16-18 and column 2, lines 49-62.) Thus, Elson generates a parse tree to represent a new version of source code instead of to define a control flow of the source code.

Furthermore, neither Horiguchi nor Elson provide any teaching or suggestion directed to selecting source code elements from a parse tree. More specifically, as recognized by the Examiner, Elson does not teach or suggest generating source strings for **selected** ones of the source code elements from a parse tree. (*See* Examiner's Action, page 5.) Horiguchi does not cure this deficiency of Elson. In fact, Horiguchi is not even directed to generating source string for selected

ones of source code elements identified from a parse tree generated to define a control flow. On the contrary, Horiguchi is directed to language translation that includes creating a syntax parse tree from a sentence. (*See* column 7, lines 5-9 and Figure 2B.) Horiguchi **does not select** portions of the sentence to create the syntax tree but each leaf of the syntax parse tree represents is a feature structure for **each** word of the sentence. Thus, Horiguchi provides no teaching or suggestion of selecting ones of a parse tree as recited in independent Claims 1 and 23.

Turning now specifically to independent Claims 19 and 20, neither Elson nor Horiguchi teach or suggest checking a finite state model in a logic model checker for certain properties of a software based system. As stated above, neither Elson nor Horiguchi are directed to verification models but to an improved system for modifying source code and for translation from one language to another language, respectively.

In summary, the combination of Elson and Horiguchi do not even address **automatically extracting verification models** from source code as presently claimed. The cited combination also does not teach or suggest providing **an input language for a logic model checker**. Additionally, the cited combination provides no teaching or suggestion of generating a parse tree **to define a control flow** from source code for procedural elements. Furthermore, the cited combination does not address **selecting** elements of a parse tree.

Thus, for at least the reasons above, the cited combination of Elson and Horiguchi does not teach each and every element of independent Claims 1, 19-20 and 23 and Claims dependent thereon. Accordingly, the cited combination does not provide a *prima facie* case of obviousness of Claims 1-23 and, therefore, does not render Claims 1-23 unpatentable. Consequently, the Applicants respectfully requests the Examiner withdraw the rejection of Claims 1-23 and allow issuance thereof.

Furthermore, one skilled in the art would not be motivated to combine Horiguchi with Elson since Elson is directed to updating or modifying complex source code (*see* Abstract) and Horiguchi is directed to translations from a source language (*i.e.*, English) to a target language (*i.e.*, Japanese) (*see* column 2, lines 8-10).

Specifically addressing dependent Claim 18, the Examiner cites Horiguchi to teach a data dependency graph as recited therein. Horiguchi teaches a bilingual database pair with a source example language and target example language structure. (*See* column 10, lines 5-9.) The bilingual database pair, however, does not have directed edges from first data dependency graph nodes to successive data dependency graph nodes if the successive data dependency graph nodes are used at least once in a definition of the first data dependency graph nodes as recited in Claim 18. Instead, the bilingual database pair presents a word in a source language and a corresponding word in the target language. (*See* column 10, lines 5-9 and Figure 2B.) The Applicant does not find where the bilingual database pair has direct edges to successive nodes if the successive nodes are used in a definition of the first data dependency graph nodes. Additionally, the Applicant does not find, nor does the Examiner cite, such a teaching or a suggestion in Elson.

Furthermore, even if Horiguchi teaches a data dependency graph as claimed by the Examiner, Horiguchi does not teach or suggest a data dependency graph based on nodes corresponding to function statements as recited in Claim 18. Insted, Horiguchi teaches **each** feature of a word is mapped to an appropriate value. (*See* Examiner's Action, page 16 and column 7, lines 9-18 and Figure 2B of Horiguchi.) Thus, even considering that Horiguchi teaches constructing a data dependency graph, Horiguchi does not teach or suggest a data dependency graph based on nodes corresponding to function statements.

IV. Conclusion

In view of the foregoing amendment and remarks, the Applicant now sees all of the Claims currently pending in this application to be in condition for allowance and therefore earnestly solicits a Notice of Allowance for Claims 1-23. The Applicant requests the Examiner to telephone the undersigned attorney of record at (972) 480-8800 if such would further or expedite the prosecution of the present application.

Respectfully submitted,

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